TEMIC

TELEFUNKEN Semiconductors

TDA 4480-C

Multi standard quasi parallel-sound processor for TV-sets

Technology: Bipolar

Features

- High signal sensitivity
- Simple filter configuration and few external components
- Processing of two carrier stereo signals
- Low intercarrier distortions
- ESD protected
- Alignment free AM demodulator for the standard L
- VCO controlled mixer stage converts intercarrier frequencies of different standards into a preferred sound IF
- Optimum tuning characteristic

Case: 20-pin dual inline plastic

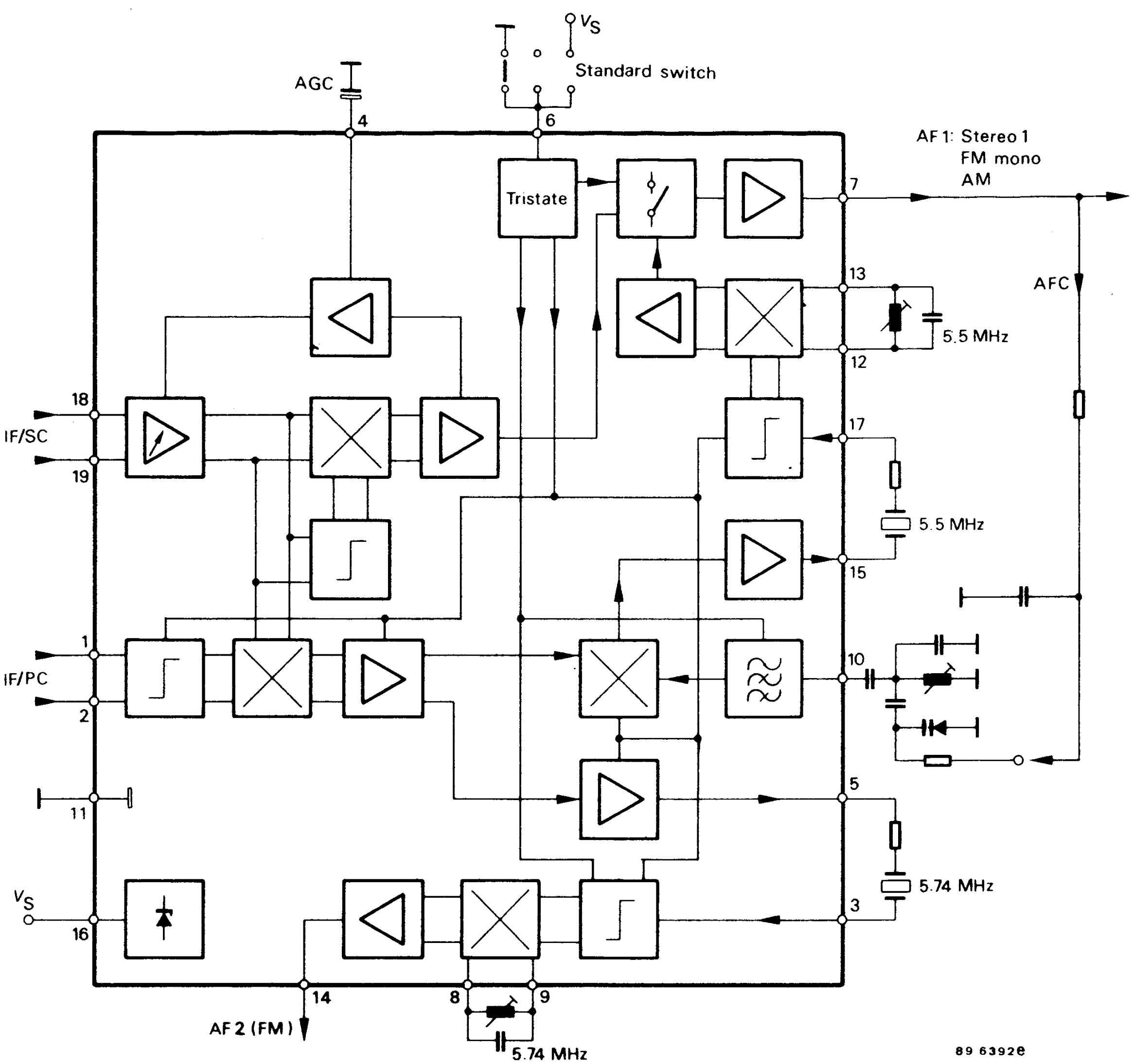


Figure 1 Block diagram

Pin Configuration

Pin	Symbol	Function
1–2		Vision-IF-carrier input
3		Intercarrier input 5.74 MHz
4		AGC time constant
5		Intercarrier output 5.74 MHz
6		Standard switch
7		AF output 1
8-9		Phase tank circuit 5.74 MHz
10		VC0 tank circuit

Pin	Symbol	Function
11		Ground
12-13		Phase tank circuit 5.5 MHz
14		AF output 2
15		Intercarrier output 5.5 MHz
16		Supply voltage
17		Intercarrier input 5.5 MHz
18-19		Sound-IF-carrier input
20		n.c.

Circuit Description

The integrated circuit allows the high quality processing of sound carrier for different TV standards. The circuit requires separate vision and audio carrier inputs. It delivers the output audio signal for mono, two channels or stereo applications.

Audio carrier signal (simple or double carrier, FM and AM) is applied via three stage AGC controlled broad band amplifier which delivers regulated output signal for two mixing stages. One mixer works for AM-demodulation and AGC-function whereas the second mixer produces the sound intercarrier IF-frequencies (5.5/5.74 MHz).

Vision carrier signal for the intercarrier generation is delivered from the demodulator tank of the video IF circuit (TDA 4439, TDA 4453). It is then matched via a limiter stage to the FM intercarrier mixer. FM-sound-IF-carrier reaches the quadrature demodulator via the selection circuit and the following limiter amplifier. The final audio signal is supplied to the low ohmic output (Pin 7,14) with low pass filter character.

There is a switchable converter for different audio standards (4.5, 6.00 and 6.5 MHZ), which mixes the sound 1P-signal properly e.g. at 5.5 MHz. The VC0 (Pin 10) must be controlled across the sound output (Pin 7) which includes AFC-function.

Sound signal at the AM-modulation is introduced via standard switch in the first sound channel, whereas the intercarrier, converter section and both FM demodulators are switched off. In case of sound IF converter operation, the second sound channel and the AM-section are switched off. The standard mode is controlled by a tristate signal on Pin 6.

Absolute Maximum Ratings

Reference point Pin 11, unless otherwise specified

Parameters		Symbol	Value	Unit
Supply voltage	Pin 16	V_S	10 to 13.5	V
Supply current	Pin 16	I_S	80	mA
External voltage	Pin 6	V_{ext}	V_S	V
	Pin 1, 2, 3, 4, 5, 7, 8, 9, 12, 13, 14, 15, 17, 18, 19	V_{ext}	6	V
Power dissipation (in soldered position)		P_{tot}	1	W
Junction temperature		T_j	125	°C
Ambient temperature range		T_{amb}	- 25 to + 70	°C
Storage temperature range		T_{stg}	- 25 to + 125	°C

Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient	R_{thJA}	60	K/W

Electrical Characteristics

V_5 = 12 V, T_{amb} = 25 °C, reference point pin 11, f_{PC} = 38.9 MHz, f_{SC1} = 33.4 MHz, f_{SC2} = 33.1578 MHz, SC1/SC2 = -7 dB, unless otherwise specified

Parameters	Test Conditions / Pin	Symbol	Min	Type	Max	Unit
Supply voltage range	Pin 16	V_S	10		13.5	V
Supply current	FM-operation, Pin 16 AM-operation, Pin 16	I_S I_S		65 40		mA mA
Output DC voltage	Pin 7,14	V_0		3.5		V
Standard switching voltage	Standard B/G, Pin 6 Standard L, Pin 6 converter operation Pin 6	V V V	1.7 0 3.5	2.2	2.7 1.5 V_S	V V V
Standard switching current	$V_6 \leqq 5$ V Pin 6	I			20	µA
Picture carrier input voltage	Pin 1,2	v	5	10	20	mV
Min. sound carrier input voltage SC1	5.5 MHz-output Pin 18,19 signal –3 dB	v		50		µV
Max. sound carrier input voltage SC1	Pin 18,19	v		100		mV
AGC range				65		dB
Audio output voltage	FM-deviation = 30 kHz m = 80 % Pin 7,14	v		500		mV_{eff}
Audio voltage difference between both outputs	Pin 7,14	v			± 1	dB
Harmonic distortion AM-operation	f_{mod} = 1 kHz, Pin 7,14 FM-deviation = 30 kHz	d		0.5		%
Harmonic distortion AM-operation	f_{mod} = 1 kHz, Pin 7 m = 80 %, v_{18-19} = 10 mV	d		1.5	3.0	%
Min. output load	Pin 7,14	R	3			kΩ
Signal to noise ratio (Standard B/G) according to CCIR 468-2 specifications, SC1: v_{18-19} = 10 mV, PC: v_{1-2} = 10 mV, prelimited demodulator picture carrier signal from TDA 4453 reference signal: f_{mod} = 1 kHz, FM deviation = 30 kHz						
Black burst 1. channel/2. channel [1)]	Pin 7/14	(S=N)/N		62/60		dB
Grid test signal 1. channel/2. channel [1)]	Pin 7/14	(S=N)/N		50/48		dB
Converter						
DC voltage	$V_6 \geqq 3.5$ V Pin 10	V_{10}		2.7		V
Tuning range	Pin 10	f	9		13	MHz
Input resistance	Pin 10	R		100		kΩ
Input capacity	Pin 10	C		12		pF

Parameters	Test Conditions / Pin	Symbol	Min	Type	Max	Unit
Signal to noise ratio (Standard B/G) according to CCIR 468-2 specifications, SC1: v_{18-19} = 10 mV, PC: v_{1-2} = 10 mV, prelimited demodulator picture carrier signal from TDA 4453 reference signal: f_{mod} = 1 kHz, FM deviation = 30 kHz						
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Tuning range	Pin 10	f	9		13	MHz
Input resistance	Pin 10	R		100		kΩ
Input capacity	Pin 10	C		12		pF

[1)] Standard B/G IF-modulated FBAS-signal

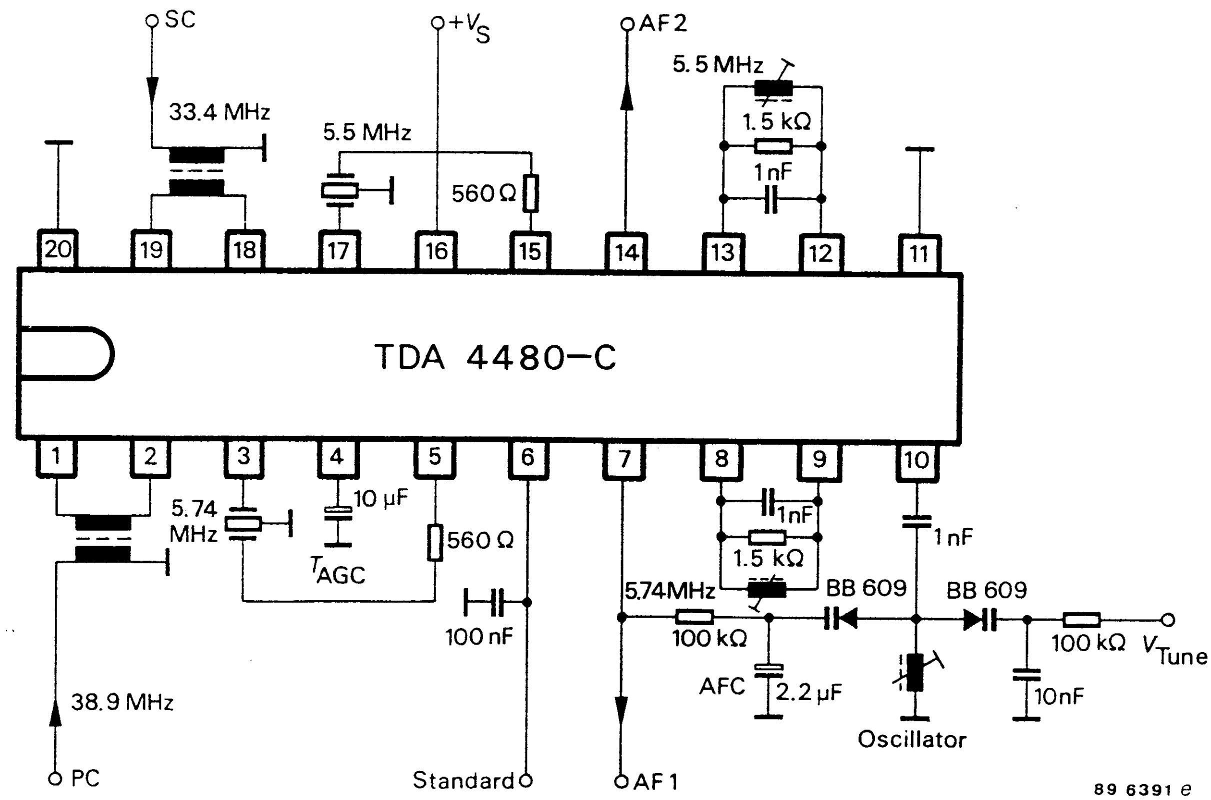
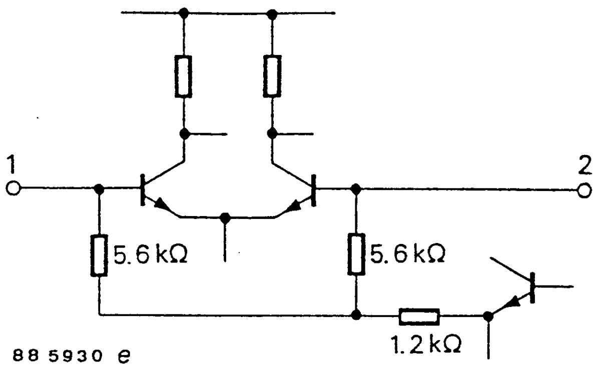
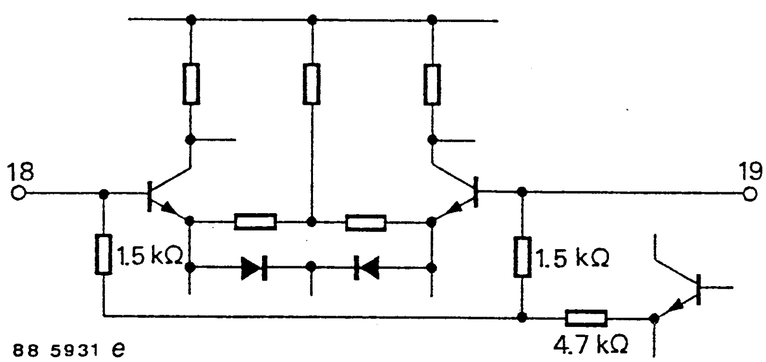


Figure 2: Test circuit



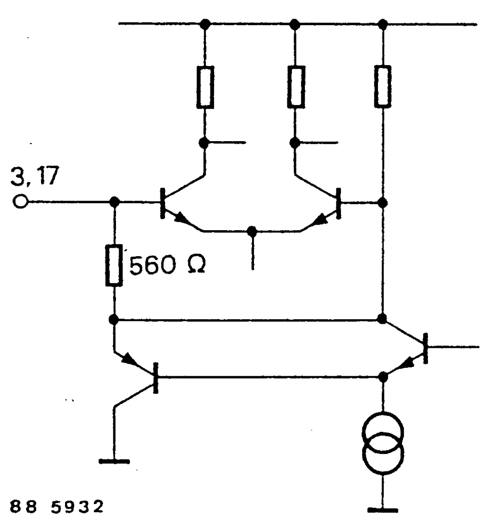
Pin 1,2

IF-input
vision carrier



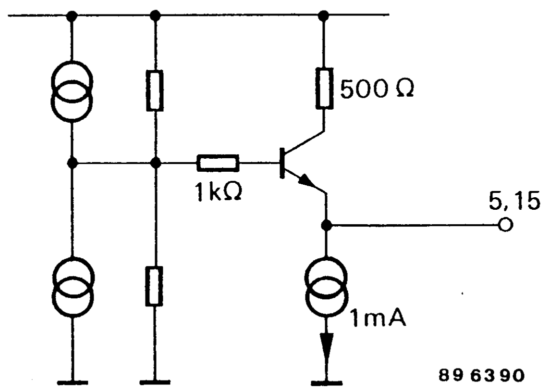
Pin 18,19

IF-input
sound carrier



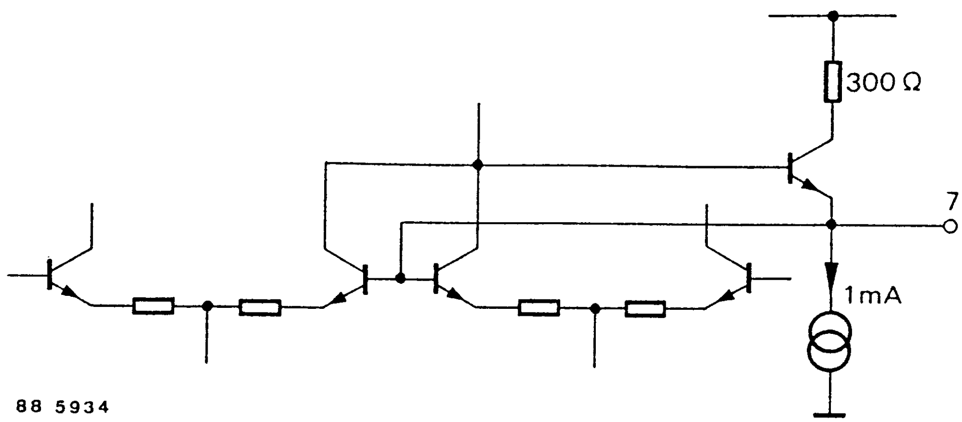
Pin 3 (17)

Intercarrier input
Pin 3: 5.74 MHz
Pin 17: 5.5 MHz



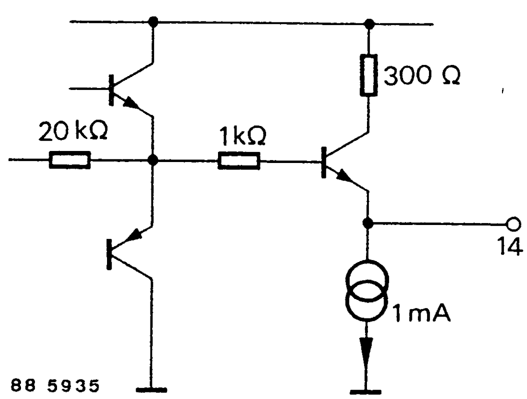
Pin 5 (15)

Intercarrier output
Pin 5: 5.74 MHz
Pin 15: 5.5 MHz



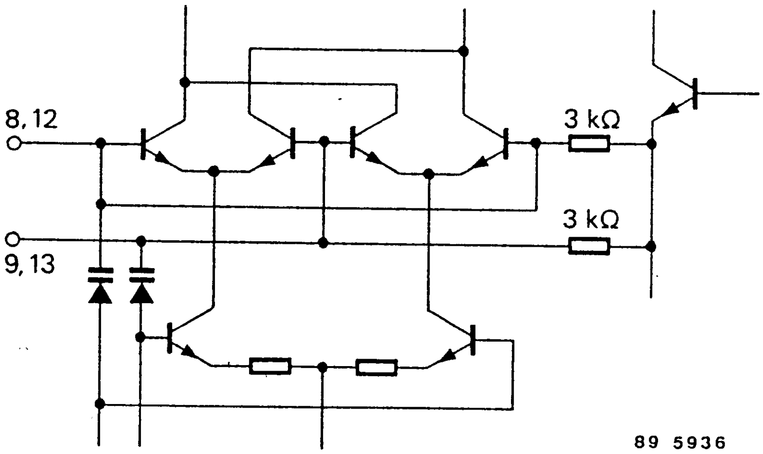
Pin 7

AP-output AM/PM
(channel 1, 5.5 MHz)



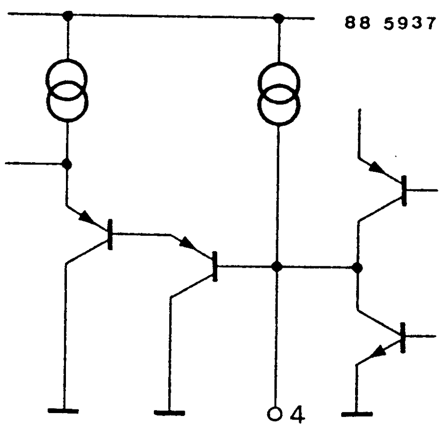
Pin 14

AF-output FM
(channel 2, 5.74 MHz)



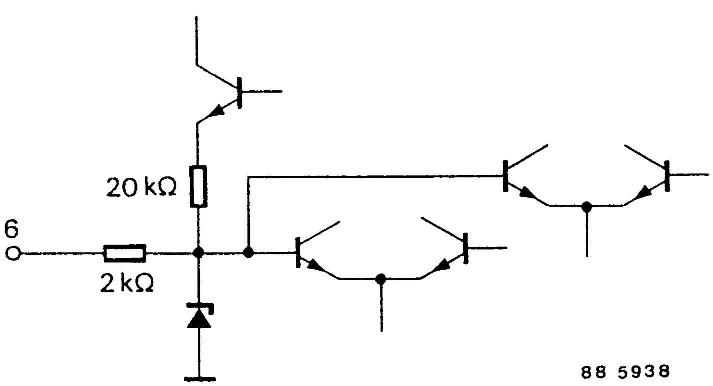
Pin 8,9 (12,13)

Phase tank circuit
Pin 8, 9 : 5.74 MHz
Pin 12,13 : 5.5 MHz



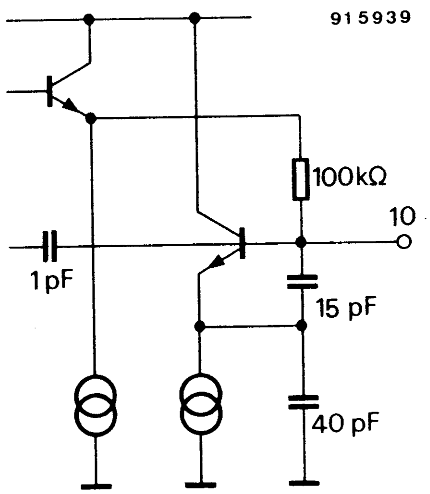
Pin 4

AGC time constant



Pin 6

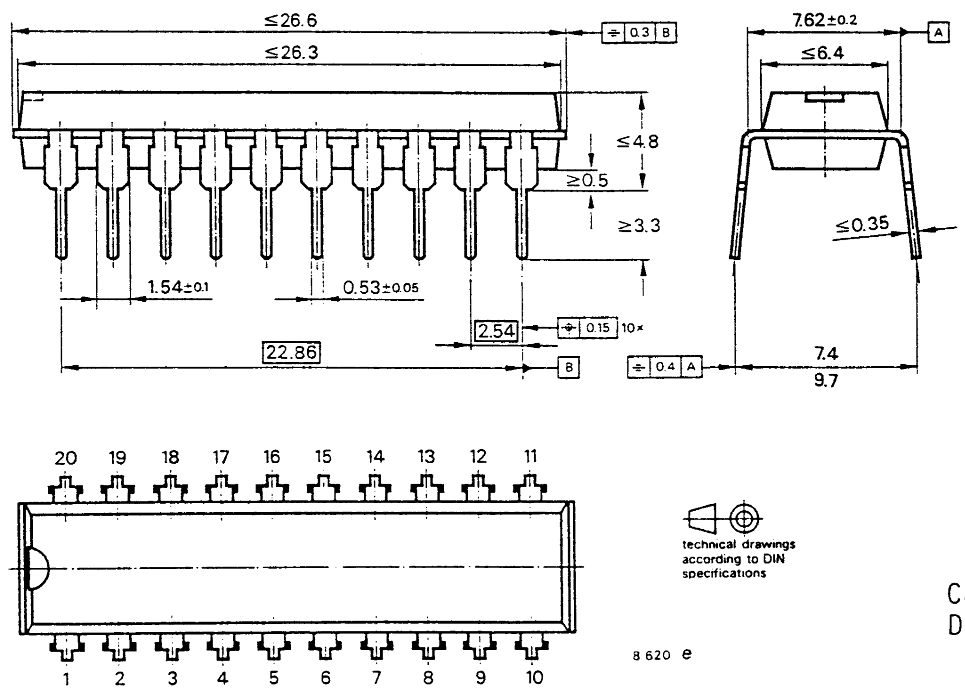
Standard switch



Pin 10

VC0 tank circuit

Dimensions in mm



Case:
DIP 20

OZONE DEPLETING SUBSTANCES POLICY STATEMENT

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements and

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

Of particular concern is the control or elimination of releases into the atmosphere of those substances which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) will soon severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of any ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA and

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

TEMIC can certify that our semiconductors are not manufactured with and do not contain ozone depleting substances.

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